Upgrades to the Operational Monte Carlo Wind Speed Probability Program

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ABSTRACT

The Joint Hurricane Testbed (JHT) is currently providing support to update and improve the Monte Carlo wind speed probability model (hereafter MC model). The MC model estimates the probability that any given location will experience 34, 50, or 64 kt winds over a given forecast period. The MC model incorporates track, intensity, and storm size forecast uncertainty into probabilistic wind forecasts that have been provided directly to the public since 2006, when the product was introduced to NHC operations. Since then, the MC model has proven to be a useful tool for decision makers prior to hurricane landfall. Examples of its uses include determining boundaries and timing of evacuation decisions, helping public utilities plan for and respond to hurricane-related power outages, and providing the Navy with information needed to make decisions to prepare bases prior to the onset of damaging winds.

Several updates are being developed and tested under JHT support. These updates include improvements to the temporal interpolation scheme, applying bias corrections to make wind speed probabilities more consistent with other NHC guidance products, and extending the probabilities to 7 days. Two of the updates involve providing new information regarding predicted forecast uncertainty and probabilistic time of arrival/departure of winds from the existing algorithm. The details of each MC model update, examples showing how each update has impacted the MC model's performance, and a demonstration of the benefits of these updates and additions to decision makers will be discussed.